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Indian Standard
GRADING OF CONTINUOUS FILAMENT VISCOSE RAYON YARN AND ACETATE YARN, BRIGHT AND DULL
(First Revision)

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

September 1968

Indian Standard

GRADING OF CONTINUOUS FILAMENT VISCOSE RAYON YARN AND ACETATE YARN, BRIGHT AND DULL

(First Revision)

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Indian Standard

GRADING OF CONTINUOUS FILAMENT VISCOSE RAYON YARN AND ACETATE YARN, BRIGHT AND DULL

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 31 May 1968, after the draft finalized by the Silk, Man-Made Fibre and Products Sectional Committee had been approved by the Textile Division Council.

0.2 With the increase in the use of continuous filament viscose rayon yarn and acetate yarn in different sectors of the weaving industry, the demand for various grades of such yarns has arisen. This standard was, therefore, prepared with the intention of clearly defining the various grades of continuous filament viscose rayon yarn and acetate yarn and thereby eliminating the ambiguity and confusion arising from the interpretation of the grades. It is hoped that this standard would enable the buyer to select the correct grade of yarn for a particular requirement.

0.3 This standard is related to the manufacturing and trade practices commonly followed in the country in this field.

0.4 Considerable assistance has been rendered by the National Rayon Corporation Ltd, Mohone, Kalyan and The Silk and Art Silk Mills' Research Association (SASMIRA), Bombay, in the preparation of this standard.

0.5 This standard was first published in 1963. The Government of India constituted a Study Group for Textile and Fibre Manufacturers of the Export Sector which, in turn, appointed a panel for making studies in relation to silk and art silk fibres and fabrics. This Panel, in its recommendation, pointed out that the bulk of rayon yarn produced indigenously was unsuitable for use on automatic looms and recommended that the grades prescribed in the Indian Standard be suitably upgraded. The Sectional Committee considered the recommendations of the Panel, made extensive studies regarding production methods followed in the country, collected data regarding the actual practices of grading of rayon yarn being followed in the country, and decided to upgrade the standard in respect of certain characteristics, such as number of knots, broken filaments and tenacity. This revision has been brought out to give effect to those changes.

0.6 This standard contains Note 2 under clause **A-1.13** and foot-notes in Tables 1 to 5 which call for an agreement between the buyer and the seller.

0.7 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes a method of grading continuous filament viscose rayon yarn and acetate yarn, bright and dull, wound on packages.

1.1.1 This standard is applicable only to single yarns of viscose and acetate rayon.

2. TERMINOLOGY

2.0 For the purpose of this standard, the definitions given in IS : 232-1967† and IS : 1324-1966‡ and the following shall apply.

2.1 Conventional Allowance — A fixed percentage which is added to the oven-dry weight of a textile material previously freed from any finish, lubricant or size. The percentage is fixed for each textile material so as to include both the moisture regain of the material when in approximate equilibrium with the standard atmosphere and the normal finish which is removed in the usual wet processing treatments.

2.2 Packages — The units from which yarn is to be unwound and which together constitute the consignment. The packages may be of various shapes and winding patterns (cones, cakes, cheeses, hanks, pirns, etc).

3. GENERAL REQUIREMENTS

3.1 The material shall be examined for its appearance (colour), black specks, formation, cross ends and loops, milkiness and dyeing characteristics.

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*Rules for rounding off numerical values (*revised*).

†Glossary of textile terms — natural fibres (*first revision*).

‡Glossary of textile terms relating to man-made fibre and fabric industry (*first revision*).

4. SPECIFIC REQUIREMENTS

4.1 The material shall be tested for its commercial weight, tex (or denier), tenacity, number of filaments, number of knots, broken filaments, sulphur content and turns per metre.

4.1.1 *Commercial Weight* — The commercial weight of the material shall be determined by the method prescribed in **A-1**.

4.1.2 *tex (or Denier)* — The count of the material in tex (or denier) shall be determined by the method prescribed in **A-2**.

4.1.3 *Tenacity* — The single strand tenacity (dry) of the material shall be determined by the method prescribed in **A-3**.

4.1.4 *Filaments* — The number of filaments in the material shall be determined by any suitable method. A common method is outlined in **A-4**.

4.1.5 *Number of Knots* — The number of knots in the material shall be counted.

4.1.6 *Broken Filaments* — The number of broken filaments in the material shall be counted.

4.1.7 *Dyeing Characteristics* — If required, the material shall be dyed by a commercially satisfactory method and the dyed yarn examined visually for the evenness of dyeing.

4.1.8 *Sulphur Content* — The sulphur content of the material shall be determined by the method given in **A-5**.

4.1.9 *Turns per Metre* — The turns per metre value of the material shall be determined by the method prescribed in **8.1** of IS : 832-1964*.

5. GRADING

5.1 The viscose rayon yarn and acetate yarn shall be graded for each of the various characteristics applicable to the type of package being tested as given in the appropriate Tables 1 to 5 in accordance with **B-4**.

5.2 The lot shall be classified to be of that grade which corresponds to the lowest one out of the grades determined for individual characteristics.

6. MARKING OF GRADE

6.1 Each lot of the material graded shall be designated by its grade, namely, Grade 1 or Grade 2 or Grade 3, which shall be suitably marked on a red label affixed on each cone, cake and hank bundles and on the case, carton (or bale) containing the material.

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*Method for determination of twist in yarn.

TABLE 1 CLASSIFICATION OF YARN IN CONES

(*Clauses* 0.6 *and* 5.1)

Sl No.	Characteristic	Grade		
		1	2	3
i)	Commercial weight of the lot, percent of the weight specified by the manufacturer	Up to ±5	±5 to 10	±10 to 15
ii)	Appearance (colour)	Uniform or very slightly off colour	Medium off colour	Heavy off colour
iii)	Number of knots on the face of the cone:	*Not more than*	*Not more than*	*Not more than*
	a) Viscose rayon yarn, 2-kg cone:			
	40 d	40	45	57
	60 d	24	33	42
	75 d	20	28	36
	100 d	16	23	30
	120 d	14	21	27
	150 d	12	18	24
	300 d and above	8	13	18
	b) Acetate yarn:			
	75 d 100 d } 1·25-kg cone	10	15	22
	120 d 150 d } 1·5-kg cone 300 d	12	18	26

iv) Broken filaments at places:	*Not more than*	*Not more than*	*More than, but not fuzzy*
a) Viscose rayon yarn:			
40 d	21	52	52
60 d	15	37	37
75 d	12	29	29
100 d	9	22	22
120 d	8	18	18
150 d and above	6	15	15
b) Acetate yarn, all denier	4	11	12
v) Black specks	Barely visible	Slightly soiled, if not with grease or oil. Dirt in the form of specks or rings of light to medium grey	Heavily soiled with grease, oil, dirt spots. Dirt, dark grey or black as specks or rings
vi) Formation	Well-built, slight bulging, slight ridges, soft noses, good tail	Fairly-built, heavy bulging, medium ridges, medium soft noses, broken tail, slightly bruised	Poorly-built, heavy ridges, extremely soft noses, no tail or broken tail
vii) Cross ends and loops	Permissible on face but not at the back	Permissible on face but not at the back	Permissible on both face and back
viii) tex (or denier), allowable variation specified value, percent:			
a) Above 8·4 tex (or 75 d)	Up to ±4	Up to ±4	±4 to 10
b) 8·4 tex (or 75 d) and below	Up to ±6	Up to ±6	±6 to 12

(Continued)

TABLE 1 CLASSIFICATION OF YARN IN CONES — *Contd*

Sl No.	Characteristic	Grade		
		1	2	3
ix)	Number of filaments, for filament denier:			
	a) 3 and above	As specified	One filament less than the specified value	Two filaments less than the specified value
	b) Less than 3	do	Two filaments less than the specified value	Three filaments less than the specified value
x)	Milkiness:			
	a) Bright yarn	Very slightly milky	Slightly milky	Milky
	b) Dull yarn	Very slightly uneven in dullness	Slightly uneven in dullness	Uneven in dullness
xi)	Sulphur	Trace	Trace	More than trace
xii)	Tenacity (dry), g/tex (or g/d):			
		Not less than		*Below*
	a) Viscose rayon yarn:			
	Bright	14·85 (or 1·65)	13·5 to 14·85 (or 1·5 to 1·65)	13·5 (or 1·5)
	Dull	13·5 (or 1·5)	12·6 to 13·5 (or 1·4 to 1·5)	12·6 (or 1·4)
	b) Acetate yarn:			
	Bright	9·0 (or 1·0)	8·1 to 9·0 (or 0·9 to 1·0)	8·1 (or 0·9)
	Dull	8·1 (or 0·9)	7·2 to 8·1 (or 0·8 to 0·9)	7·2 (or 0·8)
xiii)	Dyeing characteristics	Even commercially	Slightly uneven commercially	Uneven
xiv)	Turns per metre	As agreed to between the buyer and the seller with a tolerance of ±10 percent on the agreed value, for the lot and ±15 percent for each cone.		

7. PACKING

7.1 Inland Packing — The material shall be packed in accordance with the provisions laid down in Section 2 of IS : 2195-1964*.

7.2 Seaworthy Packing — The material for export shall be packed so as to ensure seaworthiness.

8. MARKING

8.1 Cases, cartons (or bales) shall be neatly stencilled in indelible ink with the following information:

a) Nomenclature of contents including grade;

b) Gross weight;

c) Commercial weight;

d) Name of the manufacturer, initials or trade-mark;

e) Consignee's name and address; and

f) Country of origin.

8.1.1 Each package may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

9. SAMPLING

9.1 Representative samples of the material for the purpose of testing its various characteristics shall be drawn as given in **B-1** to **B-3**. The conformity of the lot to the requirements of the declared grade shall be determined in accordance with **B-4**.

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*Code for inland packaging of man-made fibre fabrics and man-made fibre yarns.

TABLE 2 CLASSIFICATION OF YARN IN CAKES

(*Clauses* 0.6 *and* 5.1)

SL No.	CHARACTERISTIC	GRADE		
		1	2	3
i)	Commercial weight of the lot, percent of the weight specified by the manufacturer	Up to ±5	±5 to 10	±10 to 15
ii)	Appearance (colour)	Uniform or very slightly off colour	Medium off colour	Heavy off colour
iii)	Black specks	Barely visible	Slightly soiled, if not with grease or oil. Dirt in the form of specks or rings of light to medium grey	Heavily soiled with grease, oil and dirt spots. Dirt dark, less grey or black as specks or rings
iv)	Formation	Good formation, no laps, no curliness, no cross ends, slightly high or low	Good formation, single lap, no curliness, no cross ends, slightly high or low	Multiple laps, slightly curly, or slight blowouts
v)	tex (or denier), allowable variation from specified value:			
	a) Above 8·4 tex (or 75 d)	Up to ±4	±4	±4 to 10
	b) 8·4 tex (or 75 d) and below	Up to ±6	±6	±6 to 12
vi)	Number of filaments, for filament denier:			
	a) 3 and above	As specified	One filament less than the specified value	Two filaments less than the specified value

b) Below 3	do	Two filaments less than the specified value	Three filaments less than the specified value
vii) Milkiness:			
a) Bright yarn	Very slightly milky	Slightly milky	Milky
b) Dull yarn	Very slightly uneven in dullness	Slightly uneven in dullness	Uneven in dullness
viii) Sulphur	Trace	Trace	More than trace
ix) Tenacity (dry), g/tex (or g/d):			
	Not less than		*Below*
a) Viscose rayon yarn:			
Bright	14·85 (or 1·65)	13·5 to 14·85 (or 1·5 to 1·65)	13·5 (or 1·5)
Dull	13·5 (or 1·5)	12·6 to 13·5 (or 1·4 to 1·5)	12·6 (or 1·4)
b) Acetate yarn:			
Bright	9·0 (or 1·0)	8·1 to 9·0 (or 0·9 to 1·0)	8·1 (or 0·9)
Dull	8·1 (or 0·9)	7·2 to 8·1 (or 0·8 to 0·9)	7·2 (or 0·8)
x) Dyeing characteristics	Even commercially	Slightly uneven commercially	Uneven
xi) Turns per metre	As agreed to between the buyer and the seller with a tolerance of ± 10 percent on the agreed value for the lot and ± 15 percent for each cake.		

TABLE 3 CLASSIFICATION OF YARN IN CHEESES

(*Clauses* 0.6 *and* 5.1)

Sl No.	Characteristic	Grade		
		1	2	3
i)	Commercial weight of the lot, percent of the weight specified by the manufacturer	Up to ±5	±5 to 10	±10 to 15
ii)	Appearance (colour)	Uniform or very slightly off colour	Medium off colour	Heavy off colour
iii)	Number of knots in a 0·5-kg cheese (on the face only):	*Not more than*	*Not more than*	*Not more than*
	a) Viscose rayon yarn:			
	40 d	9	12	15
	60 d	6	9	11
	75 d	5	7	10
	100 d	4	6	8
	120 d	4	6	7
	150 d	3	5	6
	300 d and above	2	4	5
	b) Acetate yarn	3	6	12
iv)	Black specks	Barely visible	Slightly soiled, if not with grease or oil. Dirt in the form of specks or rings of light to medium grey	Heavily soiled with grease, oil and dirt spots. Dirt dark, less grey or black as specks or rings
v)	tex (or denier), allowable variation from specified value, percent:			
	a) Above 8·4 tex (or 75 d)	Up to ±4	Up to ±4	±4 to 10
	b) 8·4 tex (or 75 d) and below	Up to ±6	Up to ±6	±6 to 12

vi) Number of filaments, for filament denier:			
a) 3 and above	As specified	One filament less than the specified value	Two filaments less than the specified value
b) Less than 3	do	Two filaments less than the specified value	Three filaments less than the specified value
vii) Milkiness:			
a) Bright yarn	Very slightly milky	Slightly milky	Milky
b) Dull yarn	Very slightly uneven in dullness	Slightly uneven in dullness	Uneven in dullness
viii) Sulphur	Trace	Trace	More than trace
ix) Tenacity (dry), g/tex (or g/d):			
	Not less than		*Below*
a) Viscose rayon yarn:			
Bright	14·85 (or 1·65)	13·5 to 14·85 (or 1·5 to 1·65)	13·5 (or 1·5)
Dull	13·5 (or 1·5)	12·6 to 13·5 (or 1·4 to 1·5)	12·6 (or 1·4)
b) Acetate yarn:			
Bright	9·0 (or 1·0)	8·1 to 9·0 (or 0·9 to 1·0)	8·1 (or 0·9)
Dull	8·1 (or 0·9)	7·2 to 8·1 (or 0·8 to 0·9)	7·2 (or 0·8)
x) Dyeing characteristics	Even commercially	Slightly uneven commercially	Uneven
xi) Turns per metre	As agreed to between the buyer and the seller with a tolerance of ± 10 percent on the agreed value for the lot and ± 15 percent for each cheese.		

TABLE 4 CLASSIFICATION OF YARN IN PIRNS

(*Clauses* 0.6 *and* 5.1)

SL No.	CHARACTERISTIC	GRADE 1	GRADE 2	GRADE 3
i)	Commercial weight of the lot, percent of the weight specified by the manufacturer	Up to ±5	Up to ±5	±5 to 10
ii)	Appearance (colour)	Uniform or very slightly off colour	Medium off colour	Heavy off colour
iii)	Black specks	Barely visible	Slightly soiled, if not with grease or oil. Dirt in the form of specks or rings of light to medium grey	Heavily soiled with grease, oil and dirt spots. Dirt dark, less grey or black as specks or rings
iv)	Formation	Well-built, traverse as required, tight nose, started at correct place, knots on outside of traverse	Fairly-built, some ridges and slight variation in starting place	Poorly-built, soft
v)	tex (or denier), allowable variation from specified value, percent:			
	a) Above 8·4 tex (or 75 d)	Up to ±4	Up to ±4	±4 to 10
	b) 8·4 tex (or 75 d) and below	Up to ±6	Up to ±6	±6 to 12

vi) Number of filaments, for filament denier:			
a) 3 and above	As specified	One filament less than the specified value	Two filaments less than the specified value
b) Less than 3	do	Two filaments less than the specified value	Three filaments less than the specified value
vii) Milkiness:			
a) Bright yarn	Very slightly milky	Slightly milky	Milky
b) Dull yarn	Very slightly uneven in dullness	Slightly uneven in dullness	Uneven in dullness
viii) Sulphur	Trace	Trace	More than trace
ix) Tenacity (dry), g/tex (or g/d):			
	Not less than		*Below*
a) Viscose rayon yarn:			
Bright	14·85 (or 1·65)	13·5 to 14·85 (or 1·5 to 1·65)	13·5 (or 1·5)
Dull	13·5 (or 1·5)	12·6 to 13·5 (or 1·4 to 1·5)	12·6 (or 1·4)
b) Acetate yarn:			
Bright	9·0 (or 1·0)	8·1 to 9·0 (or 0·9 to 1·0)	8·1 (or 0·9)
Dull	8·1 (or 0·9)	7·2 to 8·1 (or 0·8 to 0·9)	7·2 (or 0·8)
x) Dyeing characteristics	Even commercially	Slightly uneven commercially	Uneven
xi) Turns per metre	As agreed to between the buyer and the seller with a tolerance of ± 10 percent on the agreed value for the lot and ± 15 percent for each pirn.		

TABLE 5 CLASSIFICATION OF YARN IN HANKS

(*Clauses* 0.6 *and* 5.1)

Sl No.	Characteristic	Grade		
		1	2	3
i)	Commercial weight of the lot, percent of the weight specified by the manufacturer	Up to ±5	Up to ±5	±5 to 8
ii)	Appearance (colour)	Uniform or very slightly off colour	Medium off colour	Heavy off colour
iii)	tex (or denier), variation allowable from specified value, percent:			
	a) Above 8·4 tex (or 75 d)	Up to ±4	±4	±4 to 10
	b) 8·4 tex (or 75 d) and below	Up to ±6	±6	±6 to 12
iv)	Number of filaments, for filament denier:			
	a) 3 and above	As specified	One filament less than the specified value	Two filaments less than the specified value
	b) Less than 3	do	Two filaments less than the specified value	Three filaments less than the specified value

v) Milkiness :			
a) Bright yarn	Very slightly milky	Slightly milky	Milky
b) Dull yarn	Very slightly uneven in dullness	Slightly uneven in dullness	Uneven in dullness
vi) Sulphur	Trace	Trace	More than trace
vii) Tenacity (dry), g/tex (or g/d):			
	Not less than		*Below*
a) Viscose rayon yarn:			
Bright	14·85 (or 1·6)	13·5 to 14·85 (or 1·5 to 1·6)	13·5 (or 1·5)
Dull	13·5 (or 1·5)	12·6 to 13·5 (or 1·4 to 1·5)	12·6 (or 1·4)
b) Acetate yarn:			
Bright	9·0 (or 1·0)	8·1 to 9·0 (or 0·9 to 1·0)	8·1 (or 0·9)
Dull	8·1 (or 0·9)	7·2 to 8·1 (or 0·8 to 0·9)	7·2 (or 0·8)
viii) Dyeing characteristics	Even	Slightly uneven	Uneven
ix) Turns per metre	As agreed to between the buyer and the seller with a tolerance of ±10 percent on the agreed value for the lot and ±15 percent for each hank.		

APPENDIX A

(*Clauses* 4.1.1 *to* 4.1.4 *and* 4.1.8)

METHODS OF TEST

A-1. COMMERCIAL WEIGHT OF VISCOSE RAYON YARN AND ACETATE YARN

A-1.1 Test Specimen — Take one reduced sample from one part of the integrated sample (*see* **B-3.6**) and take one package from it. Weigh the package correct to one place of decimal. Take off the wrappers and cut the yarn in the package with a sharp knife in the direction of the axis and at right angles to the surface of the package. Take out the support and weigh the support together with the wrappers correct to one place of decimal. The difference between the two weights shall constitute the net weight of the package:

a) If the net weight of the package is more than 100 g, place the yarn flat and take two layers of approximately the same thickness and weighing together 100 g, one from the inside and the other from the outside of the package.

b) If the net weight of the package is 100 g or less, take the entire yarn.

The yarn so taken as in **A-1.1**(a) or **A-1.1**(b) above shall constitute the test specimen.

A-1.2 Procedure — Transfer the test specimen to a previously-weighed stoppered vessel and weigh the vessel with the specimen correct to the nearest milligram. From the weights of the vessel with and without the test specimen, find by subtraction the weight of the test specimen. Follow the procedure prescribed in **A-1.3** or **A-1.4**.

A-1.3 Put the test specimen in a muslin bag (previously boiled several times) of known oven-dry weight, the size of the bag being such that the yarn is not compressed. Depending upon the condition of the yarn in the lot, treat the test specimen according to **A-1.3.1** to **A-1.3.4**, whichever is applicable, taking care not to damage the specimen.

A-1.3.1 If the yarn in the lot is without size, but has been treated with normal finish or with a special lubricant and the supplier has not indicated the agents and the method for removing the special lubricant, immerse the bag with the specimen in a solution weighing 25 times the weight of the bag and its contents, containing natural soap 5 g/l of soft water (maximum hardness : calcium carbonate 5 ppm *w/v*) at 70° to 75°C. Allow the bag to remain in the solution for 30 minutes and add soft water heated to 70°C until 25 percent of the solution overflows. Remove the bag from the bath and centrifuge it. Rinse the bag for 15 minutes twice in soft water at 40°C, centrifuging it after every rinse.

NOTE — If the supplier has recommended the agents and the method of removing the special lubricant, the specimen shall be treated according to his recommendation.

A-1.3.2 If the yarn in the lot is sized with a water-insoluble size and the supplier has not indicated the agents and the method of removing the size, immerse the bag with the specimen in a solution weighing 40 times the weight of the bag and its contents, containing Marseilles-type soap 10 g/l of soft water (maximum hardness : calcium carbonate 5 ppm *w/v*) and heat the solution to 30°C. Add dilute caustic soda or dilute sulphuric acid solution and adjust the *p*H between 9·5 and 10·0. Allow the solution to cool and keep the bag in it for at least 12 hours. At the end of this period, raise the temperature to 85°C in 30 minutes, keep the solution at this temperature for 2 hours and the bag in motion all the time. Remove the bag and centrifuge it. Rinse it for 15 minutes twice in soft water at 85°C and once in distilled water at 40°C, centrifuging it after each rinse.

NOTE — If the supplier has recommended the agents and the method of removing the water-insoluble size, the specimen shall be treated according to his recommendation.

A-1.3.3 If the yarn in the lot is sized with a water-soluble size containing starch and the supplier has not indicated the agents and the method for removing the size, immerse the bag with the specimen in a solution weighing 40 times the weight of the bag and its contents, containing diastase 2 g/l of soft water (maximum hardness : calcium carbonate 5 ppm *w/v*). Heat the solution to 50°C and allow the bag to remain in the solution for at least 12 hours at approximately 40°C. Remove the bag and transfer it to a bath containing Marseilles-type soap 5 g/l of soft water at 85°C. Keep the solution at 85°C for 1 hour and the bag in motion all the time. Remove the bag and centrifuge it. Rinse it for 15 minutes, twice in soft water at 85°C and once in distilled water at 40°C, centrifuging it after each rinse.

NOTE — If the supplier has recommended the agents and the method of removing the water-soluble size containing starch, the specimen shall be treated according to his recommendation.

A-1.3.4 If the yarn in the lot is sized with a water-soluble size not containing starch and the supplier has not indicated the agents and the method for removing the size, immerse the bag with the specimen in a solution containing Marseilles-type soap 5 g/l of soft water (maximum hardness : calcium carbonate 5 ppm *w/v*) at 85°C. Keep the solution at 85°C for 1 hour and the bag in motion all the time. Remove the bag and centrifuge it. Rinse it for 15 minutes, twice in soft water at 85°C, and once in distilled water at 40°C, centrifuging it after each rinse.

NOTE — If the supplier has recommended the agents and the method for removing the water-soluble size not containing starch, the specimen shall be treated according to his recommendation.

A-1.4 Extract the specimen in a thimble with dichloromethane (methylene chloride) (*see* Note 1) in a Soxhlet apparatus for at least 3 hours at a rate of 6 c/h and allow the entrained solvent to evaporate. Put the specimen in a muslin bag (previously boiled several times) of known oven-dry weight. Wash the specimen well by alternate immersion in running hot water and wringing by hand 12 times. Immerse in a 0·5 percent solution of an active concentrated malt extract of 50°C using liquor to specimen ratio of 20 to 30 : 1, and wring by hand repeating the process 3 times. Return the specimen to the solution, heat to 70°C and maintain at that temperature for 15 minutes. Wash thoroughly in hot distilled water, squeeze, mangle or centrifuge, and dry at room temperature. For removal of gelatine and oxidizable oils, treat the specimen in a solution containing 1 percent of Lissapol N, by weight, 1 percent of Lissapol C, by weight, and 1 percent of ammonia (sp gr 0·88), by weight, for one and a half hours at 50°C and treat further for a period of one and a half hours in the same bath at 70° to 75°C. Wash thoroughly and dry at room temperature (*see* Note 2).

NOTE 1 — If the test specimen is acetate yarn, extract it with petroleum ether (BP 40° to 60°C) instead of dichloromethane.

NOTE 2 — Size prepared from coarsely-ground undecorticated tamarind seed powder may not be completely removed by this procedure.

A-1.5 Place the bag (with its contents) in the drying oven maintained at 105° to 110°C and dry it to constant weight.

NOTE 1 — The weight shall be taken to be constant when the difference between two consecutive weighings at an interval of 20 minutes is less than 0·05 percent of the first of the two weighings.

NOTE 2 — The weighing shall be made either without removing the bag from the oven (but with the air-flow stopped) or by weighing it in a previously-weighed stoppered container, after the two have cooled.

A-1.6 Find the oven-dry weight of the specimen by the following formula:

$$D = a - b$$

where

D = oven-dry weight, in g, of the specimen;

a = oven-dry weight (constant weight), in g, of the bag with the specimen (*see* **A-1.5**); and

b = known oven-dry weight, in g, of the muslin bag (*see* **A-1.3** and **A-1.4**).

A-1.7 Calculate loss in weight of the specimen by the following formula rounding off the value to one place of decimal:

$$\text{Loss in weight of the specimen, percent} = \frac{N - D}{D} \times 100$$

where

N = weight, in g, of the test specimen (*see* **A-1.2**); and

D = oven-dry weight, in g, of the same specimen (*see* **A-1.6**).

A-1.8 Treat the remaining packages in the reduced sample similarly (*see* **A-1.1** to **A-1.7**) and find (a) the weight of the wrappers and supports, and (b) value for loss in weight, percent, of all the packages (test specimens) in the reduced sample.

A-1.9 Calculate (a) the average weight of wrappers and supports, and (b) the average value for loss in weight, percent, of all the specimens in the reduced sample.

A-1.10 Calculate the weight, in grams, of wrappers and supports of all the packages in the case, carton (or bale) from which the reduced sample was drawn, by multiplying the average weight of wrappers and supports (*see* **A-1.9**) by the number of packages in the case, carton (or bale) (*see* **B-3**), rounding it off to the nearest integer.

A-1.11 Find the tare of the case, carton (or bale) by adding to the weight of the empty case, carton (or wrappers of a bale) (*see* **B-3**), the weight of wrappers and supports of all the packages in the case, carton (or bale) (*see* **A-1.10**).

A-1.12 Find the net weight, in g, of the yarn in the case, carton (or bale) by subtracting the tare (*see* **A-1.11**) from the gross weight of the case, carton (or bale) (*see* **B-3**).

A-1.13 calculate the commercial weight of the yarn in the case, carton (or bale) by the following formula:

$$\text{Commercial weight of the yarn in the case, carton (or bale)} = \frac{(100 + A + B)\,N}{(100 + P)}$$

where

A = conventional allowance (*see* Note 1);

B = further addition, if any, for special lubricant or size (*see* Note 2);

N = net weight, in g, of yarn in the case, carton (or bale) (*see* **A-1.12**); and

P = average loss in weight, percent, on washing and drying of all the specimens in the reduced sample (*see* **A-1.9**).

NOTE 1 — The conventional allowance (*see* **2.1**) for viscose rayon yarn and acetate yarn is 13 and 9 percent respectively of oven-dry weight.

NOTE 2 — The addition for special lubricant or size shall be as agreed upon between the buyer and the seller.

A-1.14 Determine similarly (*see* **A-1.10** to **A-1.13**) the commercial weight of the remaining cases, cartons (or bales) in the bulk sample. Calculate the average of the weight values.

A-1.15 Calculate, correct to the nearest integer, the commercial weight of the lot either (a) by multiplying the average commercial weight of the yarn in the cases, cartons (or bales) by the number of cases, cartons (or bales) in the whole lot, or (b) by using the following formula:

$$\text{Commercial weight of the lot} = \frac{W_1}{W_0} \times C_0$$

where

W_1 = average of the commercial weight values, in g, of yarn in the cases, cartons (or bales) constituting the bulk sample (*see* **A-1.14**);

C_0 = invoiced weight, in g, of the lot (as given in the original invoice); and

W_0 = average of the invoiced weight values, in g, of yarn in all the cases, cartons (or bales) constituting the bulk sample [to be calculated from the weight of the cases, cartons (or bales) as noted in the original invoice].

NOTE — For the purpose of this calculation, it is necessary that the weight of each case, carton (or bale) shall appear explicitly or implicitly on the delivery note or invoice.

A-2. tex (OR DENIER)

A-2.1 Test Sample — For the purpose of this test, the packages drawn from a lot as under **B-3.6** shall constitute the test sample.

A-2.2 Test Specimen — For determining the universal count of yarn in tex (or denier), (except when it is on pirns) in a lot, two skeins of yarn each of at least 500 m in length and at least 7·5 g in weight shall be reeled out, one from the outside and one from the inside of each package of the test sample taking precaution to avoid any change of twist. The skeins shall be marked separately and conditioned in the standard atmosphere while free from tension.

NOTE — Reel off test specimen skeins for tex (or denier) tests and also for single-strand tenacity (dry) tests at the same time and from the same package. This is required so that both the tests may be carried out on the yarn specimen from the same package. In order to calculate the tenacity of the yarn, the tex or denier of the yarn has to be determined and hence the yarn specimen on which the tex (or denier) test and single-strand tenacity (dry) test are carried out should be from the same package.

A-2.2.1 When the yarn is on pirns, one skein of about 500 m in length and weighing at least 7·5 g, shall be reeled out from the middle portion of each pirn. The total number of skeins reeled shall be at least 10.

A-2.2.2 Each skein, reeled off in accordance with the requirements of **A-2.2** or **A-2.2.1**, shall constitute the test specimen.

A-2.3 Atmospheric Conditions for Reeling

A-2.3.1 The test specimens shall be reeled under the prevailing atmospheric conditions from the packages constituting the test sample.

A-2.4 Apparatus

A-2.4.1 *Drying Oven* — provided with forced ventilation and positive valve control and capable of maintaining a temperature of 105° to 110°C.

A-2.4.2 *Wrap Reel* — Any reel employing a straight wind traverse and having a perimeter between 0·5 to 1·5 m shall be used. The reel shall have thread guides fixed on a horizontal bar which shall be provided with a counting device indicating the length of the yarn reeled out and a bell to ring just before the hundredth revolution of the reel.

A-2.5 Method of Reeling

A-2.5.1 *Procedure* — When reeling, keep the yarn under standard tension stated below to avoid kinks, curls and slack in the yarn as this will lay the yarn smoothly on the reel at the specified speed. From each of the above skein which has been conditioned in the standard atmosphere according to **A-2.2**, a shorter skein of measured length and of weight not less than 5 g shall be reeled out under a standard tension of (tex/2) g in standard atmosphere. The length of the yarn reeled out shall be measured with a precision of 0·1 percent.

A-2.5.2 Operate the reel by hand or by motor (preferably the latter) at a speed of 100 to 150 rpm when reeling out yarn if it is in the skein form and use a speed of 200 to 300 rpm for reeling out yarn from packages other than skeins. Tie the tail end of the skein to its starting end.

A-2.6 Procedure

A-2.6.1 The skeins of known length prepared as in **A-2.5** above shall be treated in the manner prescribed in **A-1.3** or **A-1.4**.

A-2.6.2 Determine the oven-dry weight of each test specimen, in grams, by following the method prescribed in **A-1.5** and **A-1.6**.

A-2.6.3 Correct the weight of each test specimen to a common basis of conventional allowance (*see* **2.1**) for the class of yarn under test as prescribed in **A-2.6.4** or **A-2.6.5**.

A-2.6.4 If the yarn under test is continuous filament viscose rayon, correct the weight of each test specimen by the following formula:

$$\text{Weight, in g, corrected to } F' \text{ (equivalent to 13 percent conventional allowance)} = \frac{S \times 113}{100}$$

where

S = oven-dry weight, in g, of the test specimen.

A-2.6.5 If the yarn under test is acetate, correct the weight of each test specimen by the following formula:

$$\text{Weight, in g, corrected to } F'' \text{ (equivalent to 9 percent conventional allowance)} = \frac{S \times 109}{100}$$

where

S = oven-dry weight, in g, of the test specimen.

A-2.6.6 Calculate the tex (or denier) of each test specimen by the following formula:

$$\text{tex} = \frac{F \times 1\,000}{L}, \text{ and}$$

$$\text{Denier} = \frac{F \times 9\,000}{L}$$

where

F = F' in case of viscose rayon yarn and F'' in case of acetate yarn, and

L = length of the test specimen in m measured to an accuracy of 0·1 percent.

A-3. SINGLE-STRAND TENACITY (DRY)

A-3.1 Test Sample — For the purpose of this test, samples of the packages drawn from the lot as in **B-3.6** shall constitute the test sample.

A-3.2 Test Specimen — Draw 10 specimens of adequate length, one at a time, from the outside and another 10, one at a time, from the inside of each package (other than a pirn) constituting the test sample, taking them from the side of the package instead of over the top (to avoid change in twist). In the case of pirns, draw 10 specimens of adequate length, one at a time, from the middle portion of each pirn constituting the test sample. Place each group of 20 (or 10) in separate receptacles, without change of twist, so as to identify the parent package from which each group was drawn and whether it was drawn from inside or outside of the package. This shall constitute the test specimen.

A-3.3 Atmospheric Conditions for Testing — The test shall be carried out in standard atmosphere at 65 ± 2 percent relative humidity and 27° ± 2°C temperature (*see also* IS : 196-1966*).

A-3.4 Conditioning of Test Specimens — Prior to test, the test specimens drawn as prescribed in **A-3.2** shall be conditioned to moisture

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*Atmospheric conditions for testing (*revised*).

equilibrium in standard atmosphere at 65 ± 2 percent relative humidity and 27° ± 2°C temperature.

NOTE 1 — Since cellulosic yarns, especially, show a moisture hysteresis, it is essential that the test specimens be brought to equilibrium from the same side, that is, from the lower or dry side.

NOTE 2 — Moisture equilibrium as required for testing, may be secured for loose material, such as skeins of yarns, in 3 to 4 hours if the material is exposed to standard atmosphere. But for tight-yarn packages, such as cones and cheeses or pirns, moisture equilibrium is reached slowly. An exposure to standard atmosphere for 48 hours will usually give the desired equilibrium.

A-3.5 Apparatus — For the purpose of this test, any one of the strength testers conforming to the applicable requirements given in Appendix A of IS : 1228-1957* shall be used.

NOTE — In case of dispute, the referee method shall be the constant-rate-of-load testing machine.

A-3.6 Procedure

A-3.6.1 Take a group of test specimen (*see* **A-3.2**). Take one test specimen out of this group and clamp one end of the specimen in the jaws of one of the clamps of the testing machine. Pass the other end of the test specimen through the open space between the open jaws of the second clamp taking care to see that no twist is lost. A standard pretension equal to (tex/2) g is applied to the end of the test specimen before closing the jaws of the second clamp. The length of the test specimen between the grips of the jaws shall be adjusted to 25 or 50 cm with a precision of 0·1 percent. Clamp the specimen between the jaws of the machine and carry out the test to rupture. Watch the behaviour of the test specimen carefully and if it breaks at a point within 1·25 cm of the point of contact with the clamp, discard it and in lieu thereof, draw another test specimen from the parent package and test it.

NOTE — Even if the test result is discarded on account of a break near the jaws, the result should be noted, but should not be taken into account in the calculations. The group of results becomes unreliable if the frequency of the breaks near the jaws exceeds 25 percent.

A-3.6.2 Read off the dial (or scale) of the testing machine, the breaking load of the test specimen in grams.

A-3.6.3 Determine in a similar manner, the breaking load of the remaining test specimens in the group.

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*Method for determination of dry and wet single-strand strength and elongation of continuous filament rayon yarn and acetate yarn.

A-3.6.4 From the values of the breaking load obtained (*see* **A-3.6.3**), calculate, correct to two places of decimal, the tenacity of each test specimen by the following formula:

$$\text{Tenacity} = \frac{a}{b}$$

where

a = breaking load, in g, of the specimen; and

b = universal count of yarn in tex (or denier).

A-3.6.5 Find the mean tenacity of this group of test specimens.

A-3.6.6 Calculate, correct to one place of decimal, the standard deviation of the values for tenacity of the group by the following formula:

$$\begin{array}{l}\text{Standard deviation}\\ \text{of the values for}\\ \text{tenacity}\end{array} = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 + \dots (X_n - \bar{X})^2}{n}}$$

where

$X_1, X_2 \dots X_n$ = values for tenacity,

$\bar{X}$ = the average (arithmetic mean) of all the values for tenacity, and

n = the number of individual values for tenacity.

A-3.6.7 Calculate correct to two places of decimal, the error of the mean, expressed in percentage, by the following formula:

$$\text{Error of the mean, percent} = \frac{S}{n} \times \frac{100}{\bar{X}}$$

where

S = standard deviation of the values of tenacity,

n = the number of individual values for tenacity, and

$\bar{X}$ = the average (arithmetic mean) of all the values for tenacity.

A-3.6.8 If the error of the mean, percent, as determined in **A-3.6.7** is less than 2·5 percent, report correct to two places of decimal, the mean of all the tenacity values of the group obtained as in **A-3.6.5** as the tenacity of single strand of yarn (dry) for the package (*see* **A-3.2**) under test.

A-3.6.9 If the error of the mean, percent, is equal to or more than 2·5 percent, draw in the manner prescribed in **A-3.2** another group of test specimens from the package under test and find the tenacity of each specimen as prescribed in **A-3.3** to **A-3.6.4**.

A-3.6.10 Calculate the mean value and the standard error of the mean, percent, of this group of test specimens as prescribed in **A-3.6.5** to **A-3.6.7.** Report the mean value correct to two places of decimal as the tenacity of single strand of yarn (dry) of the package under test if the standard error of the mean is less than 2·5 percent.

A-3.6.11 Report this package as defective if the standard error of the mean, as calculated in **A-3.6.10**, is equal to or more than 2·5 percent.

A-3.7 Similarly test the other groups of test specimens (*see* **A-3.2**) from packages included in the test sample.

A-4. FILAMENTS

A-4.1 Test Specimen — For the purpose of this test, the packages drawn from the lot as in **B-3.6** shall constitute the test specimens.

A-4.2 Apparatus — A twist tester, normally used for determining the twist of continuous filament rayon and acetate yarn, shall be used for the purpose of this test.

A-4.3 Procedure — Set the sliding clamp of the twist tester 25 cm away from the rotating clamp. If the yarn is in the form of hanks, mount the hanks on the reel. Draw approximately 10 cm of yarn from the front of the reel (if the yarn is in the form of hanks) or from the side of the package (if the yarn is in the form of packages other than hanks) as the reel or the package rotates on its axis and lead the yarn to the twist tester.

A-4.3.1 Leaving the length drawn as a free tail near the rotating clamp of the twist tester, mount in its clamps a test length from beyond the length drawn. Cut off the free tail but do not severe the test length from the reel or the package. Revolve the rotating clamp to untwist the yarn until it is possible to pass a needle from one clamp to the other between the untwisted individual filaments of the test length examining it visually or through a magnifying glass, if necessary. Count the number of the individual filaments. Then cut off the sample mounted on the twist tester.

A-4.3.2 Draw approximately 2 m of yarn from the front of the reel or from the side of the package as the reel or the package rotates on its axis and lead it to the tester. Determine in the manner prescribed in **A-4.3.1** the number of individual filaments of another test length from beyond the length drawn.

A-4.3.3 Determine in the manner prescribed in **A-4.3.2** the number of individual filaments on three other test lengths.

A-4.3.4 Draw off approximately 100 m of yarn from the front of the reel or from the side of the package as the reel or the package rotates on its axis and lead it to the tester. Determine in the manner prescribed in **A-4.3.1**

the number of individual filaments of a test length from beyond the length drawn.

A-4.3.5 Determine in the manner prescribed in **A-4.3.2** the number of individual filaments on four test lengths.

A-4.3.6 Calculate the mean of the 10 values for the number of individual filaments for the package and report this as the number of individual filaments in the package under test.

A-4.3.7 Similarly determine the mean number of individual filaments for each of the remaining packages in the test specimen.

A-5. SULPHUR CONTENT

A-5.1 Test Sample — For the purpose of this test, samples of the packages drawn from the lot as in **B-3.6** shall constitute the test sample.

A-5.2 Test Specimen — Cut the sample under test into small strips of approximately 25 mm in length. Mix the pieces thoroughly. From the pieces so mixed, draw at least two specimens each of the following size:

Non-desulphurized sample	2 to 4 g
Desulphurized sample	20 to 40 g

A-5.3 Conditioning of Test Sample — The test sample shall be conditioned prior to evaluation in a standard atmosphere of 65 ± 2 percent RH and 27° ± 2°C temperature for 24 hours.

A-5.4 Reagents

A-5.4.1 *Caustic Soda Solution* — 1 percent.

A-5.4.2 *Sodium Hypobromide* (NaOBr) *Solution* — prepared by adding bromine to cold sodium hydroxide solution. The resulting solution should be alkaline.

A-5.4.3 *Hydrochloric Acid Solution* — 1 : 1.

A-5.4.4 *Barium Chloride Solution* — 2 percent.

A-5.4.5 *Silver Nitrate Solution* — 2 percent.

A-5.5 Procedure

A-5.5.1 Take one test specimen as conditioned and determine its weight correct to the nearest milligram. Extract from it sulphur and sulphur compounds present therein, in the following manner.

A-5.5.2 Take the test specimen in about 250 ml of caustic soda solution in a beaker, cover it with a watch-glass to minimize losses due to evaporation and boil for an hour in a constant level water-bath (*see* Note), maintaining the temperature of water in the bath at 90° to 100°C. Keep the level of the liquid in the beaker constant by adding hot distilled water from time to time.

NOTE — The level of the liquid in the beaker should be below the level of water in the bath.

A-5.5.3 At the end of an hour of boiling, decant the extract. Wash the extracted specimen with distilled water. Add the washings to the extract.

A-5.5.4 Repeat the procedure prescribed in **5.5.2** and **5.5.3** on the same specimen two more times, extracting with 200 and 150 ml of caustic soda solution respectively.

A-5.5.5 Collect all extracts and washings and concentrate the resulting solution to a volume of 150 to 200 ml.

A-5.5.6 Oxidize the sulphur in the solution with the addition of about 25 ml of sodium hypobromide solution. Keep the solution for about 15 minutes and then boil it. Liberate the excess of bromine by making the solution acidic with the addition of hydrochloric acid solution. After the completion of the evaluation of bromine, filter the solution and wash the precipitate. Collect the filtrate and the washings and concentrate them to 100 to 150 ml. Add barium chloride solution to precipitate the sulphate as barium sulphate. Digest the precipitate and allow it to settle overnight. Filter it with an ashless filter paper, wash till free from chloride (*see* Note) and dry. Incinerate the residue with the filter paper to constant weight and determine its weight accurately.

NOTE — Small portion of filtrate should be tested with silver nitrate solution for the absence of chloride.

A-5.5.7 Determine separately the moisture content, percent, in the material under test.

A-5.6 Calculation

A-5.6.1 From **A-5,5.1** and **A-5.5.7**, determine the dry weight of the specimen under test.

A-5.6.2 Determine the sulphur content (as barium sulphate), percent of the specimen by the following formula:

$$\text{Total sulphur (as barium sulphate), percent by weight, present in the specimen} = \frac{W_1}{W} \times 100$$

where

W_1 = weight of the residue (*see* **A-5.5.6**), and

W = dry weight of the specimen (*see* **A-5.6.1**).

APPENDIX B

(*Clause* 9.1)

SAMPLING FOR GRADING OF VISCOSE RAYON YARN AND ACETATE YARN

B-1. LOT

B-1.1 All viscose rayon yarn or acetate yarn of one definite type and grade, despatched, transported and delivered together and packed in one type of container, and all wrappers, supports, etc, being of fairly uniform weight, shall constitute the lot.

B-2. SCALE OF SAMPLING

B-2.1 The number of unopened cases, cartons (or bales) in the lot shall be counted and a number of cases, cartons (or bales) shall be selected at random in accordance with the requirements of Table 6.

TABLE 6 NUMBER OF CASES, CARTONS (OR BALES) TO BE SELECTED FROM A LOT

No. of Cases, Cartons (or Bales) in a Lot	No. of Cases, Cartons (or Bales) to be Selected
Up to 2	1
3 ,, 4	2
5 ,, 6	3
7 ,, 24	4
25 ,, 50	5
More than 50	At least 10 percent

B-2.2 The cases, cartons (or bales) selected as prescribed in Table 6 shall constitute the bulk sample.

B-3. PROCEDURE

B-3.1 Each case, carton (or bale) in the bulk sample shall be weighed, one by one, correct to 1 part in 1 000. Each case, carton (or bale) in the bulk sample shall be opened and emptied and the number of packages in each counted. Each empty case, carton (or bale) shall be weighed correct to 1 part in 1 000.

B-3.2 Out of the packages in each case, carton (or bale) in the bulk sample a number of packages shall be drawn so as to be representative of the case, carton (or wrappers of a bale) and shall be selected two at a time in accordance with the requirements of Table 7 read together with **B-3.3**.

TABLE 7 NUMBER OF PACKAGES TO BE SELECTED FROM A CASE, CARTON (OR BALE)

(*Clause* B-3.2)

No. of Packages in a Case, Carton (or Bale)	No. of Packages to be Selected
Up to 25	2
26 „ 50	4
51 „ 75	6
76 „ 100	8
101 „ 125	10
More than 125	12

B-3.3 If the yarn is on pirns, the number of packages to be selected shall be doubled.

B-3.4 For each of the cases, cartons (or bales) in the bulk sample, the packages selected shall constitute the reduced sample for that case, carton (or bale) and each reduced sample shall be kept separate so as to identify it with the parent cases, cartons (or bales). All the reduced samples taken together shall constitute the **integrated sample.**

B-3.5 If the procedure given in **B-3.4** provides less than 10 packages or, in the case of pirns, less than 20 packages from the whole lot, further packages shall be taken from the selected cases, cartons (or bales) to bring the number of packages up to 10 or, in the case of pirns, up to 20.

B-3.6 The integrated sample shall be divided into two parts, an equal number of packages from each case, carton (or bale) being included in each part and the packages selected from each of the reduced samples constituting the integrated sample (*see* **B-3.4**) being kept separate so as to identify it with the parent case, carton (or bale). One part shall be utilized for determination of commercial weight, and the other for determination of the remaining characteristics.

B-4. CRITERIA FOR CONFORMITY

B-4.1 The lot shall be considered as conforming to the requirements of the particular grade if the conditions mentioned under **B-4.2** to **B-4.5** are all satisfied.

B-4.2 Commercial Weight — The commercial weight of the lot as determined under **A-1.15** shall be within the applicable tolerances as given in the appropriate Tables 1 to 5.

B-4.3 tex (or Denier) and Tenacity — The number of packages failing to satisfy the requirements of any of these characteristics shall not exceed the acceptance number as given below:

Sample Size	*Acceptance Number*
5 to 35	1
36 „ 85	2
86 „ 100	3

B-4.4 Knots, Filaments, Length of Skein and Dyeing Characteristics — The number of packages failing to satisfy the requirements of any of these characteristics shall not exceed the acceptance number as given below:

Sample Size	*Acceptance Number*
5 to 9	1
10 „ 21	2
22 „ 35	3
36 „ 50	4
51 „ 66	5
67 „ 83	6
84 „ 100	7

B-4.5 Other Characteristics — The number of packages failing to satisfy the requirements of any of the remaining characteristics shall not exceed the acceptance number as given below:

Sample Size	*Acceptance Number*
5 to 8	2
9 „ 14	3
15 „ 20	4
21 „ 26	5
27 „ 33	6
34 „ 40	7
41 „ 47	8
48 „ 55	9
56 „ 62	10
63 „ 70	11
71 „ 78	12
79 „ 85	13
86 „ 93	14
94 „ 100	15

AMENDMENT NO. 2 MAY 1986
TO
IS : 2427-1968 GRADING OF CONTINUOUS FILAMENT VISCOSE RAYON YARN AND ACETATE YARN, BRIGHT AND DULL

(First Revision)

[This amendment has been issued to include changes in number of knots on the face of cone, number of broken filaments at places and tenacity of viscose yarn. The requirement for direction of twist has been included. Changes in number of broken filaments and number of knots have been made mainly because the existing standard specified these requirements for a 2 kg cone while in actual practice 0·7 kg cone is used for 30 denier yarn and 1 kg cone for 40 denier and 60 denier yarn. The values of tenacity of viscose yarn have been changed because indigenous wood pulp has inferior characteristics and thus gives lower tenacity yarn manufactured from it.]

(*Pages* 6 *to* 8, *Table* 1) — Substitute the following for the existing table:

TABLE 1 CLASSIFICATION OF YARN IN CONES

(*Clauses* 0.6 *and* 5.1)

Sl No.	Characteristic	Grade		
		1	2	3
i)	Tolerance for commercial mass of the lot, percent of the mass specified by the manufacturer	Up to ±5	±5 to 10	±10 to 15
*ii)	Appearance (colour)	Uniform or very slightly off colour	Medium off colour	Heavy off colour

*Grade of yarn should not be lowered only because of its lower rating in appearance.

(*Continued*)

TABLE 1 CLASSIFICATION OF YARN IN CONES — *Contd*

Sl No.	Characteristic	Grade		
		1	2	3
iii)	Number of knots on the face of the cone:			
		Not more than	*Not more than*	*Not more than*
	a) Viscose rayon yarn: kg/cone			
	30 d (0·7)	20	25	30
	40 d (1·0)	20	22	28
	60 d (1·0)	12	16	21
	75 d (2·0)	20	28	36
	100 d (2·0)	16	23	30
	120 d (2·0)	14	21	27
	150 d (2·0)	12	18	24
	300 d and above (2·0)	8	13	18
	b) Acetate yarn: kg/cone			
	75 d 100 d } (1·25)	10	15	22
	120 d 150 d 300 d } (1·5)	12	18	26
iv)	Broken filaments at places on single surface:			
	a) Viscose rayon yarn: kg/cone			
		Not more than	*Not more than*	*More than, but not fuzzy*
	30 d (0·7)	10	26	26
	40 d (1·0)	10	26	26
	60 d (1·0)	8	18	18
	75 d (2·0)	12	29	29
	100 d (2·0)	9	22	22
	120 d (2·0)	8	18	18
	150 d and above (2·0)	6	15	15
	b) Acetate yarn, all denier	4	11	12
v)	Black specks	Barely visible	Slightly soiled if not with grease or oil. Dirt in the form of specks or rings of light to medium grey	Heavily soiled with grease, oil, dirt spots. Dirt in the form of specks or rings of dark grey or black

(*Continued*)

TABLE 1 CLASSIFICATION OF YARN IN CONES — *Contd*

Sl No.	Characteristic	Grade		
		1	2	3
		Not more than	*Not more than*	*More than but not fuzzy*
vi)	Formation	Well-built, slight bulging, slight ridges, soft noses, good tail	Fairly-built, heavy bulging, medium ridges, medium soft broken tail noses, slightly bruised	Poorly-built, heavy ridges, extremely soft noses, no tail or broken tail
vii)	Cross ends and loops	Permissible on face but not at the back	Permissible on face but not at the back	Permissible on both face and back
viii)	tex (or denier), allowable variation, specified value, percent			
	a) Above 8·4 tex (or 75 d)	Up to ±4	Up to ± 4	±4 to 10
	b) 8·4 tex (or 75 d) and below	Up to ±6	Up to ± 6	±6 to 12
ix)	Number of filaments:			
	a) For filament denier 3 and above	As specified	One filament less than the specified value	Two filaments less than the specified value
	b) For filament denier less than 3	do	Two filaments less than the specified value	Three filaments less than the specified value
x)	Milkiness:			
	a) Bright yarn	Very slightly milky	Slightly milky	Milky
	b) Dull yarn	Very slightly uneven in dullness	Slightly uneven in dullness	Uneven in dullness
xi)	Sulphur	Trace	Trace	More than trace
xii)	Tenacity, g/tex (or g/d):			
		Not less than		*Below*
	a) Viscose rayon yarn:			
	Bright	14·40 (or 1·6)	12·6 to 14·40 (or 1·4 to 1·6)	12·6 (or 1·4)
	Dull	13·5 (or 1·5)	11·7 to 13·5 (or 1·3 to 1·5)	11·7 (or 1·3)

(*Continued*)

TABLE 1 CLASSIFICATION OF YARN IN CONES — *Contd*

Sr No.	Characteristic	Grade		
		1	2	3
		Not less than		*Below*
	b) Acetate yarn:			
	Bright	9·0 (or 1·0)	8·1 to 9·0 (or 0·9 to 1·0)	8·1 (or 0·9)
	Dull	8·1 (or 0·9)	7·2 to 8·1 (or 0·8 to 0·9)	7·2 (or 0·8)
xiii)	Dyeing characteristics	Even commercially	Slightly uneven commercially	Uneven
xiv)	Turns per metre	As agreed to between the buyer and the seller with a tolerance of ±10 percent on the agreed value, for the lot and ±15 percent for each cone		
xv)	Directions of twist	←——— 'S' or 'Z' Twist ———→		

(TDC 10)

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